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Reverse the curse: Maximizing the potential of resource-driven economies

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Reverse the curse: Maximizing the potential of resource-driven economies

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The challenge …

81 countries driven by resources in 2011 accounting for 26 percent of global GDP, up from 58 generating only 18 percent of world GDP in 1995

69% of people in extreme poverty are in resource-driven countries

Almost **80%** of countries whose economies have historically been driven by resources have per capita income levels below the global average, and more than **½** of these are not catching up

Almost **90%** of resources investment has historically been in upper-middle-income and high-income countries

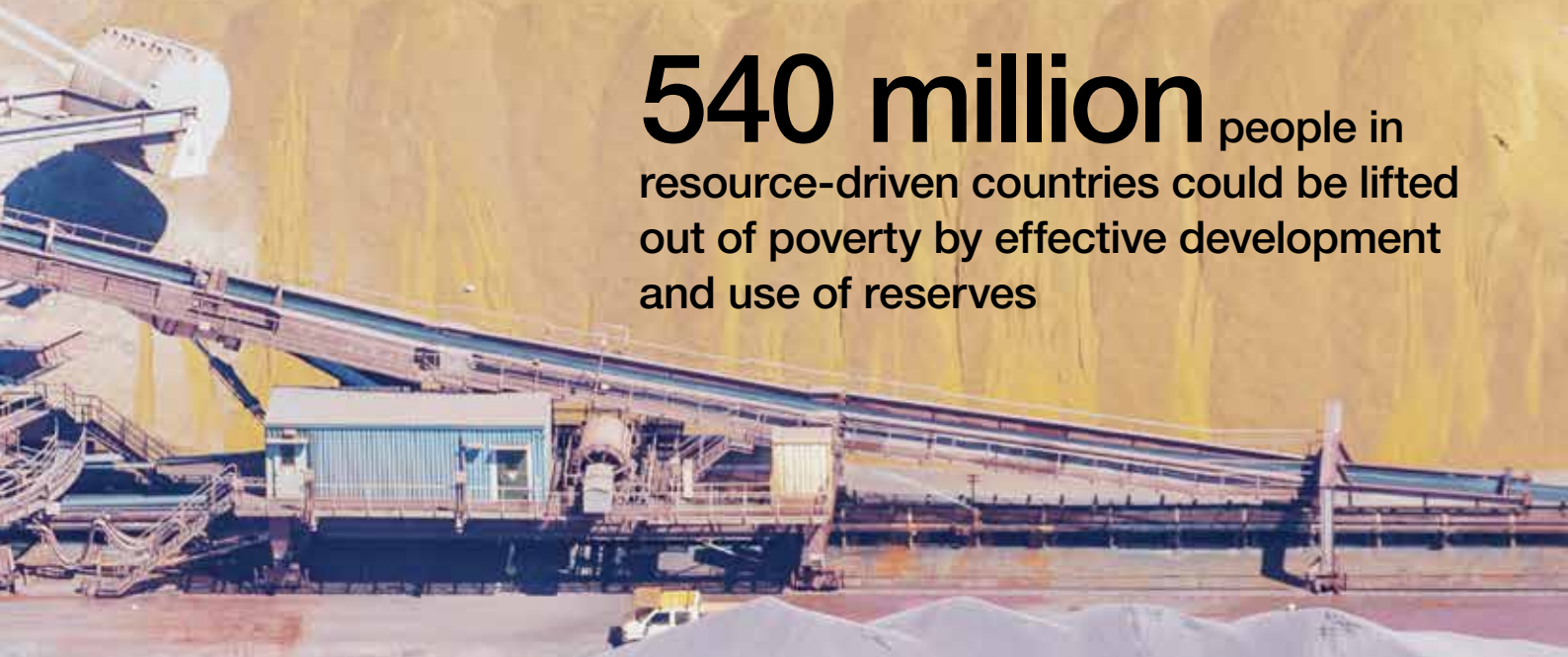
NOTE: We define “resource-driven countries” as those economies where the oil, gas, and mineral sectors play a dominant role, using three criteria: (1) resources account for more than 20 percent of exports; (2) resources generate more than 20 percent of fiscal revenue; or (3) resource rents are more than 10 percent of economic output.

… and the opportunity

~½ of the world's known mineral and oil and gas reserves are in non-OECD, non-OPEC countries

Up to **$17 trillion** of cumulative investment in oil and gas, and mineral resources could be needed by 2030—more than double the historical rate of investment

540 million people in resource-driven countries could be lifted out of poverty by effective development and use of reserves



Opportunities to share much of the **$2 trillion** of cumulative investment in resource infrastructure in resource-driven countries to 2030

50%+ improvement in resource-sector competitiveness possible through joint government and industry action

Executive summary

The historical rate of investment in oil and gas and minerals may need to more than double to 2030 to replace existing sources of supply that are coming to the end of their useful lives and to meet strong demand from huge numbers of new consumers around the world, particularly in emerging economies. If resource-driven countries, particularly those with low average incomes, use their resources sectors as a platform for broader economic development, this could transform their prospects.[1] We estimate that they could lift almost half the world's poor out of poverty—more than the number that have left the ranks of the poor as the result of China's rapid economic development over the past 20 years.

However, many resource-driven countries have failed to convert their resource endowments into long-term prosperity. Almost 80 percent of these countries have per capita income below the global average, and since 1995, more than half of these countries have failed to match the average growth rate (of all countries). Even fewer have translated growth into broad-based prosperity. On average, resource-driven countries score almost one-quarter lower than other countries on the MGI Economic Performance Index. In addition, only one-third of them have been able to maintain growth beyond the boom.

Resource-driven countries need a new growth model to transform the potential resource windfall into long-term prosperity. In this report, we lay out such a model, drawing on the many successful approaches that some resource-driven countries have employed. It has six core elements: building the institutions and governance of the resources sector; developing infrastructure; ensuring robust fiscal policy and competitiveness; supporting local content; deciding how to spend a resources windfall wisely; and transforming resource wealth into broader economic development.

Extractive companies also need a new approach to the changing resource landscape. Their relationships with governments in the countries where they operate have often been colored by tension. Governments are under pressure from citizens to reap a greater share of the rewards of developing their natural resources; extractive companies are often uncertain whether governments might withdraw their licenses or renegotiate their contracts. As exploration and production increasingly shift to developing countries and frontier markets, companies that can reframe their mission from simple extraction to ongoing partnership with host governments in economic development are likely to secure a real competitive advantage. This report offers a set of tools and approaches for achieving this relationship.

1 We define "resource-driven countries" as those economies where the oil, gas, and mineral sectors play a dominant role, using three criteria: (1) resources account for more than 20 percent of exports; (2) resources generate more than 20 percent of fiscal revenue; or (3) resource rents are more than 10 percent of economic output. We also include countries that do not currently meet these criteria but who are expected to meet them in the near future. See the appendix for more detail.

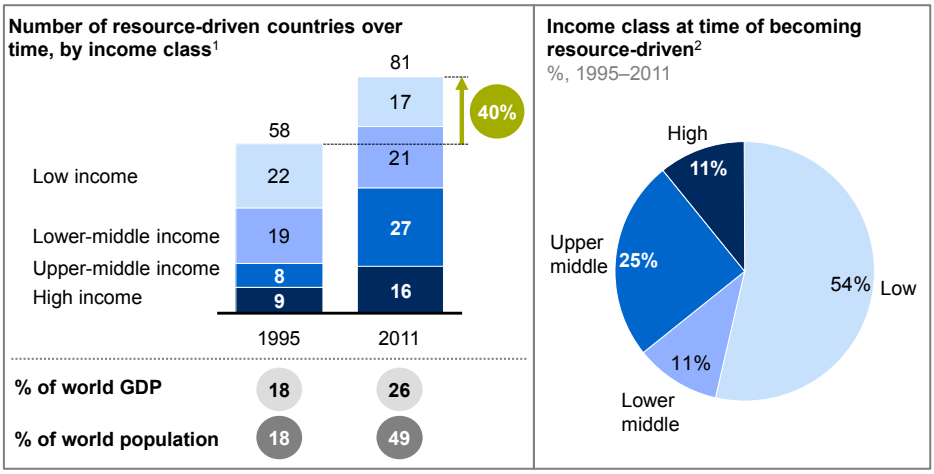
Our work builds on a substantial body of past analysis but explicitly acknowledges that resource-driven countries are at different stages of their economic development. We aim to give policy makers and extractive companies concrete and practical information to guide their approaches.

Investment of between $11 trillion and $17 trillion could transform resource-driven countries

As a result of generally rising resource prices and the expansion of production into new geographies, the number of countries in which the resources sector represents a major share of their economy has increased significantly. In 1995, there were 58 resource-driven economies that collectively accounted for 18 percent of global economic output. By 2011, there were 81 such countries, accounting for 26 percent of global economic output (Exhibit E1).

Exhibit E1

The number of resource-driven countries has increased by more than 40 percent since 1995, and most new ones have low average incomes



1 We define resource-driven countries using three criteria: (1) resources are more than 20 percent of exports; (2) resources are more than 20 percent of fiscal revenue; or (3) resource rents are more than 10 percent of GDP. Where data were not available, we estimated based on the nearest year's data.

2 World Bank income classifications based on per capita gross national income (GNI) by country; thresholds updated annually. In 2011, the World Bank thresholds for categorization were $1,026 for lower-middle income, $4,036 for upper-middle income, and $12,476 for high income.

NOTE: Numbers may not sum due to rounding.

SOURCE: UNCTADstat; International Monetary Fund; World Bank; IHS Global Insight; McKinsey Global Institute analysis

Many of these new resource-driven countries have very low incomes. Of the countries that have become resource-driven since 1995, more than half were defined as "low income" by the World Bank when they became resource-driven.[2] The increasing number of economies that rely on natural resources underlines how important it is for their governments to manage their resources wisely and to cultivate sound and productive relationships with extractive companies.

There is, of course, no certainty about the future direction resource prices will take and how these trends will affect growth in resource-driven economies. However, the following factors should be considered:

- **The unprecedented scale of new demand.** More than 1.8 billion people will join the ranks of the world's consuming class by 2025.[3] The growth of India and China is historically unprecedented: it is happening at about ten times the speed at which the United Kingdom improved average incomes during the Industrial Revolution and on around 200 times the scale. The new demand caused by this consuming class is huge. If we look only at cars, for example, we expect the global car fleet to double to 1.7 billion by 2030. Demand from the new consuming classes will also trigger a dramatic expansion in global urban infrastructure, particularly in developing economies. Every year, China could add floor space totaling 2.5 times the entire residential and commercial square footage of the city of Chicago. India could add floor space equal to another Chicago annually.

- **The need for new sources of supply.** Historically, much of the existing supply of resources has come from the Organisation for Economic Co-operation and Development (OECD) group of developed economies, but many of these resources are nearing depletion. Previous MGI research estimated that, in the absence of significant productivity improvements, the supply of energy and steel would have to increase at a rate 30 to 60 percent higher than the rate in the past 20 years.[4] Almost three-quarters of that supply in the case of energy is necessary to replace existing sources that are coming to the end of their useful lives. Peter Voser, chief executive officer of Shell, stated in 2011 that the equivalent of "four Saudi Arabias or ten North Seas over the next ten years" needs to be added just to replace declining production and to keep oil output flat.[5] Even if the world were able to achieve a step change in resource productivity—the efficiency with which resources are extracted and used—new sources would still be required to replace those that are running out.

2 World Bank income classifications are based on per capita gross national income. Thresholds are updated annually. In 2011, the World Bank's income thresholds were: low income, $1,025 or less; lower-middle income, $1,026–$4,035; upper-middle income, $4,036–$12,475; and high income, $12,476 or more.

3 We define members of the consuming class as those with daily disposable income of more than $10 (adjusted for purchasing power parity) and draw on the McKinsey Global Institute Cityscope 2.0 database.

4 *Resource Revolution: Meeting the world's energy, materials, food, and water needs*, McKinsey Global Institute and the McKinsey Sustainability & Resource Productivity Practice, November 2011.

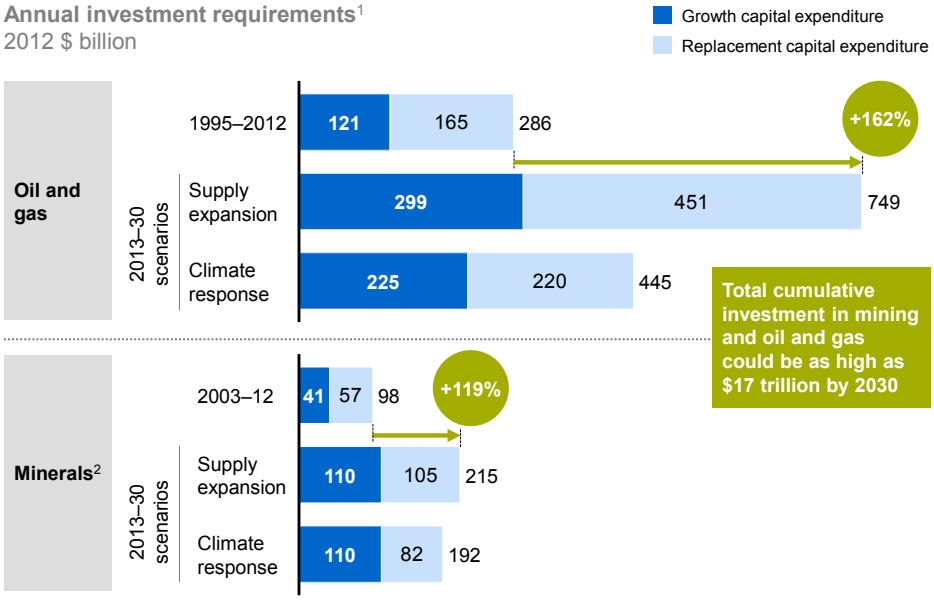
5 "Rush is on to develop smarter power," *Financial Times* Special Report, September 29, 2011.

High levels of new investment will be needed to meet demand for resources and replace existing sources of supply. Even if we assume a significant improvement in resource productivity and shifts in the primary energy mix consistent with achieving a 450-ppm carbon pathway, MGI estimates that $11 trillion to $17 trillion will need to be invested in oil and gas, and minerals extraction by 2030.[6] This is 65 to 150 percent higher than historical investment over an equivalent period (Exhibit E2).

Exhibit E2

Investment in oil and gas and minerals may need to increase at more than double historical rates to meet new demand and replace existing supply

Annual investment requirements[1]
2012 $ billion



1 See the appendix for further details on the methodology.
2 Includes iron ore, coal, copper, and an estimate for other mineral resources.
NOTE: Numbers may not sum due to rounding.
SOURCE: McKinsey Energy Insights; McKinsey Basic Materials Institute; Wood Mackenzie; Rystad Energy; IHS Global Insight; World Bank; McKinsey Global Institute analysis

Historically, almost 90 percent of that investment has been in high-income and upper-middle-income countries. But in the future, the share of resource investment outside these two groups—to low-income and lower-middle-income countries—could almost double. Almost half of the world's known mineral and oil and gas reserves are in countries that are not members of the OECD or the Organization of the Petroleum Exporting Countries (OPEC).

This undoubtedly understates the true potential for resource production in the developing world, given that relatively little exploration has taken place in these countries. For example, there is an estimated $130,000 of known sub-soil assets beneath the average square kilometer of countries in the OECD.[7] In contrast, only around $25,000 of known sub-soil assets lie beneath the average square kilometer of Africa, a continent that relies heavily on exports of natural resources. This huge disparity does not reflect fundamental differences in geology. It is likely

6 A 450-ppm pathway describes a long-term stabilization of emissions at 450-ppm carbon dioxide equivalent, which is estimated by the Intergovernmental Panel on Climate Change (IPCC) to have a 40 to 60 percent chance of containing global warming below the 2° C threshold by the end of the 21st century.

7 Paul Collier, *The plundered planet: Why we must—and how we can—manage nature for global prosperity*, Oxford University Press, 2011.

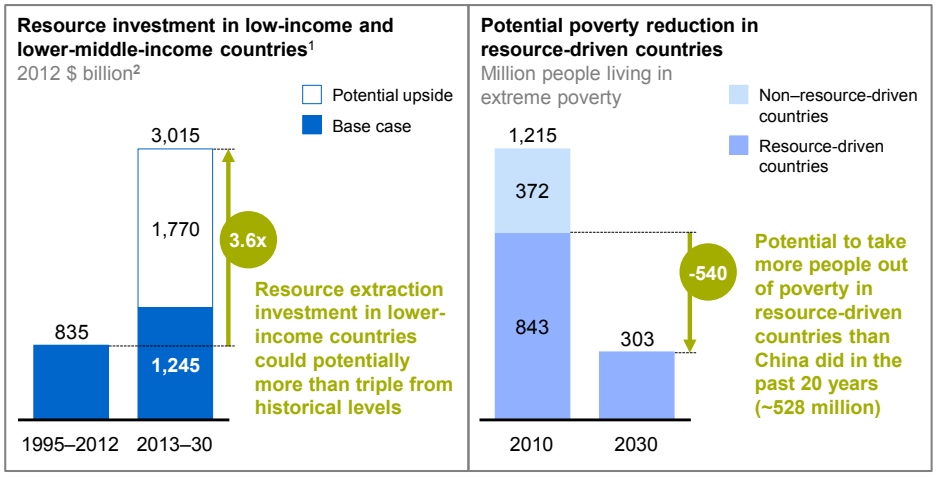
that Africa has more, not fewer, assets than advanced economies that have been extracting resources for two centuries. But to date, there has been only limited international investment in exploration and prospecting in Africa. Much of that continent's resources still await discovery.

If governments in low-income and lower-middle-income countries use their endowments wisely and develop effective collaboration with extraction companies, they can potentially transform their economies and the lives of their citizens. How large could the prize be? Based on a range of methodologies, including estimates from industry experts, announced projects, and equalization of investment per square kilometer (excluding OPEC countries), cumulative investment of between $1.2 trillion and $3 trillion is possible in low-income and lower-middle-income countries by 2030 out of the worldwide total of $11 trillion to $17 trillion. In the high case, this would be almost $170 billion a year, more than three times development aid flows to these countries in 2011.

If all resource-driven countries were to match the average historical rate of poverty reduction of the best performers in this group, there is potential to lift 540 million people out of poverty by 2030 overall (Exhibit E3).[8] This is more than the number of people that China managed to shift out of poverty over the past two decades.

Exhibit E3

Investment in resource extraction could trigger economic and social transformation in lower-income countries over the next two decades



1 As defined by the World Bank on the basis of per capita GNI in 2011. Investment includes oil and gas and minerals.
2 This represents the share of the total global cumulative investment to 2030 (up to $17 trillion in total) that could be focused on low-income and lower-middle-income countries. See the appendix for further details on the methodology.
NOTE: We have not shown poverty statistics for non–resource-driven countries to 2030.
SOURCE: McKinsey Energy Insights; McKinsey Basic Materials Institute; Wood Mackenzie; Rystad Energy; IHS Global Insight; World Bank; McKinsey Global Institute analysis

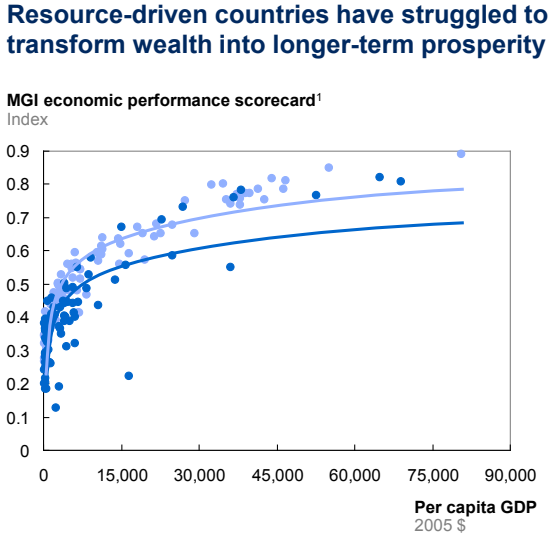
8 Further details on the methodology can be found in the appendix.

THE 20TH-CENTURY RESOURCE-DEVELOPMENT MODEL WON'T DELIVER THIS POTENTIAL

The windfall from natural resources represents a large opportunity for developing countries, but there is no guarantee they will be able to seize it and achieve sustainable, broad-based prosperity using resources as a platform. Although it is difficult to compare the economic performance of resource-driven countries due to limited data and the lack of a suitable control group, available evidence suggests that they have tended to underperform economies that do not rely on resources to the same extent. Almost 80 percent of resource-driven countries have below-average levels of per capita income. Since 1995, more than half of these countries have failed to match the global average (unweighted) per capita growth rate. Even when resource-driven economies manage to sustain above-average economic growth over the long term, they do not necessarily enhance prosperity in the broader sense, as measured by MGI's economic performance scorecard.[9] On average, resource-driven countries score almost one-quarter less than countries that are not driven by their resources, even at similar levels of per capita GDP (Exhibit E4). In Zambia, for example, poverty levels increased from 2002 to 2010 despite strong economic growth.[10]

Exhibit E4

Resource-driven countries have struggled to transform wealth into longer-term prosperity



Average economic performance score by income bracket
$ per capita

	Resource-driven[2]	Not resource-driven
0–1,000	0.24	0.28
1,000–3,000	0.31	0.41
3,000–5,000	0.36	0.46
5,000–10,000	0.42	0.51
10,000–20,000	0.46	0.64
20,000–40,000	0.73	0.78
40,000+	0.88	0.90

1 MGI index is based on metrics covering productivity, inclusiveness, resilience, connectivity, and agility.
2 Includes six future resource-driven countries.
NOTE: Three resource-driven countries have been excluded due to lack of data.
SOURCE: McKinsey Global Institute analysis

There are three broad reasons for this. The first is that many countries have struggled to develop sufficiently competitive resources sectors and ensure that production and investment are somewhat shielded from volatility in resource prices. Some countries have failed to create a supportive business environment (for example, they have not dealt with infrastructure bottlenecks), have created political risk that deters investors, or have put in place inappropriate fiscal regimes. In some cases, resentment within government and among citizens about what they perceive to have been a failure to capture a "fair share" of resource

9 The MGI economic performance scorecard measures economic progress across five dimensions: productivity, inclusiveness, resilience, agility, and connectivity. See the appendix for further details on the methodology and the specific metrics used to assess performance.

10 PovcalNet, http://iresearch.worldbank.org/PovcalNet/index.htm.

rents has led to nationalization, which in turn has frequently precipitated a fall in foreign investment and a severe economic downturn.

Second, countries have often failed to spend their resource windfalls wisely. They have been unable to manage macroeconomic instability and corruption and have struggled to use resource rents for productive long-term investment that creates clear benefits for a large share of the population. Since 2000, the average annual volatility of metals prices has been twice as high as in the 1990s. Such volatility can result in overspending during booms and excessive borrowing during busts. Too often, governments flush with resources revenue have spent it wastefully, often losing funds through corruption or spending them on increasing public-sector salaries.

Finally, countries have struggled to develop non-resources sectors, and this has left their economies even more susceptible to volatility in resource prices. Resource-led export booms have often led to exchange-rate appreciation that has made other sectors, including manufacturing, less competitive in world markets and has led to domestic cost inflation. Such effects have been dubbed "Dutch disease," an expression coined by *The Economist* in 1977. These effects are often compounded by weak institutional development in these countries because the flood of money can encourage conflict and make governments complacent about putting in place the building blocks of long-term development.

Although we acknowledge that there are many pitfalls facing resource-driven countries, some have managed successful transformations, establishing best practice that other nations can emulate. Our analysis suggests that there are three areas to get right. The first is the effective development of resources, where there are issues related to the role of the state in developing effective institutions and governance of the resources sector and to ensuring that the right infrastructure is in place. The second is capturing value from resources. Here, it is important to examine not only fiscal policy—the exclusive focus of many governments striving to make their resources sectors competitive and attractive for investors—but also broader issues affecting competitiveness, such as production costs, political risk, and the provision of local content. Third, successful resource-driven countries have managed to use the value they receive from resources to build long-term prosperity. On this third imperative, we look at issues around spending resource windfalls wisely and how best to pursue effective economic development.

It is difficult to find appropriate measures to assess the performance of countries in each of the strategic areas we highlight, so we have used the best available proxies to identify the ten countries that have had the highest performance in each area (Exhibit E5).[11] We then considered the lessons from these countries (as well as other relevant examples) on the six aspects in these key areas. Even among these leading countries, we find significant opportunities to improve performance.

11 See the appendix for further details on the methodology.

Exhibit E5

Countries performing well across the six areas of the resources value chain

	Develop resources		Capture value		Transform value into long-term development	
	Institutions and governance	Infrastructure	Fiscal policy and competitiveness[1]	Local content development	Spending the windfall	Economic development
1	Norway	Canada	Canada	Canada	Norway	Norway
2	Canada	Malaysia	Chile	Norway	Australia	Qatar
3	Australia	Norway	Norway	Qatar	Canada	Australia
4	UAE[2]	Australia	Botswana	UAE[2]	Bahrain	Iceland
5	Chile	Lithuania	Mexico	Australia	Brazil	Canada
6	Iceland	Saudi Arabia	Australia	Iceland	Kuwait	UAE[2]
7	Qatar	Namibia	Bulgaria	Malaysia	Botswana	Israel
8	Brunei Darussalam	UAE[2]	Peru	South Africa	Colombia	Bahrain
9	Oman	Iceland	Brazil	Lithuania	Chile	Brunei Darussalam
10	Brazil	Azerbaijan	Colombia	Guatemala	South Africa	Chile

1 Analysis restricted to mining sectors due to data availability and comparability issues. The analysis is based on country risk, access to skills, regulatory duplication, and taxation. The assessment excludes other aspects of competitiveness, such as energy and wage costs, and other regulatory barriers.
2 United Arab Emirates.
NOTE: Based on a variety of publicly available sources of information. See the appendix for further details on the methodology.
SOURCE: Revenue Watch; World Economic Forum; World Bank; United Nations Educational, Scientific and Cultural Organization; UN Human Development Report; Yale Environmental Performance Index; Fraser Institute; Morningstar; International Monetary Fund; International Budget Partnership; McKinsey Global Institute analysis

INSTITUTIONS AND GOVERNANCE OF THE RESOURCES SECTOR

There is a common view that a government has only two choices in the way it participates in the resources sector: letting private-sector firms operate with minimal involvement from the state beyond taxation and regulation or controlling production through a state-owned company. However, the range of possible government roles is much wider than this, as the following examples illustrate:

- **No state ownership.** In Australia and Canada and elsewhere, the state does not have direct involvement in the industry but receives taxes or royalties or both.

- **Minority investor.** The state has a minority stake in a company but does not play an active role in its management or direction, as with Thailand's stake in PTT Exploration and Production (PTTEP).

- **Majority-owned, with limited operatorship.** The state has a majority stake in a company and plays a role in the company's management, but less than 10 percent of the company's production is operated by the state, or the state operates exclusively in certain segments such as onshore oil. Examples include the Nigerian National Petroleum Corporation (NNPC), Angola's Sonangol, and India's Hindustan Copper.

- **Majority-owned operator.** These companies are fully or majority-owned by the state, and more than 10 percent of the company's production is operated by the state company. Examples include Petrobras in Brazil, Norway's Statoil, and Debswana in Botswana.

- **Government monopolist.** Pemex in Mexico and Saudi Aramco in Saudi Arabia are fully owned by the state. Those and other companies in this category account for more than 80 percent of the country's total production.

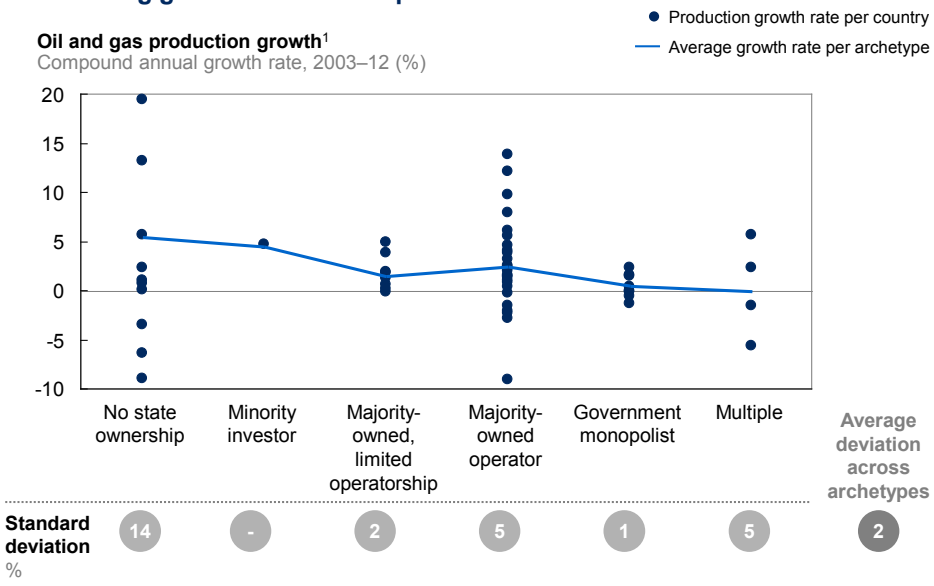
The popularity of each type of participation varies according to the resource. Today, more than half of oil and gas producers in our database, representing almost three-quarters of world production, are fully or majority state-owned. In contrast, governments have majority- or fully owned state companies in only about 24 and 20 percent of countries with iron ore and copper resources, respectively, accounting for 35 and 43 percent of production in each case.

Our analysis suggests that no single model of government participation works best in all countries—countries that have taken the same approach have experienced vastly different levels of success (Exhibit E6). The best approach depends on the context.

Regardless of the model chosen, three guiding principles are vital for successful state participation. First, governments need to establish a stable regulatory regime with clear rules and well-defined roles for each player in the sector. Second, it is important to ensure that there is competitive pressure by exposing national operators to private-sector competition, strongly benchmarking performance, or imposing other market disciplines such as scrutiny from private shareholders or bondholders. Finally, the state needs to play a central role in attracting and retaining world-class talent into the sector—even more important if the state chooses to play a more active operational role.

Exhibit E6

No one model of state participation has clearly outperformed others in achieving growth in resource production



1 Includes only countries producing more than 100 kilo-barrels of oil equivalent per day.
SOURCE: Rystad Energy; McKinsey Global Institute analysis

INFRASTRUCTURE

On average, resource-driven countries do not compare favorably with the rest of the world on their infrastructure, and this often puts investors off.[12] The Fraser Institute's survey of mining companies finds that more than 55 percent of investors considered infrastructure a deterrent to investment in 15 of the 58 countries analyzed.[13] Drawing on research by MGI and McKinsey's Infrastructure Practice, we estimate that resource-driven countries will together require more than $1.3 trillion of annual total infrastructure investment over the next 17 years to sustain projected economy-wide growth.[14] This is almost quadruple the annual investment that these countries made during the 17-year period from 1995 to 2012.[15]

This could be particularly challenging given that capital markets are not well developed in many resource-driven countries. However, these economies can help to address the infrastructure imperative by transforming the productivity of infrastructure investment—in other words, they can do more with less. Previous MGI research has identified three main levers that can help countries obtain the same amount of infrastructure for 40 percent less: improving project selection and optimizing infrastructure portfolios; streamlining delivery; and making the most of existing infrastructure, including sharing it. The third area is a particular opportunity for resource-driven countries given the large infrastructure requirements of major extractive projects.

Extractive companies are major investors and developers of infrastructure, and they are expected to invest almost $2 trillion in infrastructure in resource-driven countries in the period to 2030.[16] Given the huge need, we believe that resource-driven countries should look closely at ways of sharing infrastructure. By doing so, they can take advantage of private-sector capital and know-how; build stable, long-term partnerships with extractive companies; and achieve broader social benefits from the infrastructure that is put in place. We estimate that nearly 70 percent of investment in resource infrastructure could potentially be shared among different operators, and we see the largest opportunities in power in mining areas and pipelines in oil regions. The remaining 30 percent could potentially be shared between industry and other users. Examples include building roads that allow other users to benefit or ensuring that power capacity is sufficient to provide excess power to the grid. Of course, governments must carefully evaluate the likely costs and benefits of infrastructure sharing case by case. Overall it appears that power projects are good candidates for sharing as the benefits are high and coordination costs low. But port and rail projects, while often having substantial benefits, can create high costs related to sharing and therefore must be particularly carefully reviewed (Exhibit E7).

12 *Global competitiveness report 2012–2013*, World Economic Forum, 2012.

13 *Survey of mining companies 2012–2013*, Fraser Institute, February 2013.

14 *Infrastructure productivity: How to save $1 trillion a year*, McKinsey Global Institute and the McKinsey Infrastructure Practice, January 2013. Our estimates include road, rail, port, airports, power, water, and telecommunications.

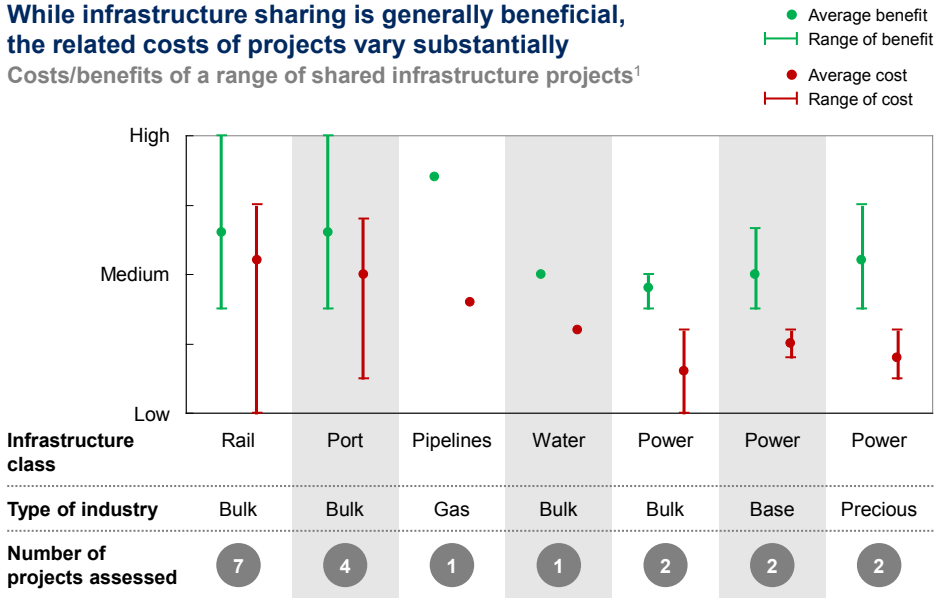
15 All figures in real 2010 US dollars.

16 This figure includes road, rail, port, power, and water facilities constructed by mining or oil companies as part of a specific project, and all crude and gas pipeline construction.

Exhibit E7

While infrastructure sharing is generally beneficial, the related costs of projects vary substantially

Costs/benefits of a range of shared infrastructure projects[1]



1 Based on an assessment of four types of benefits (economies of scale, economies of scope, spillover effects, and the likelihood of alternative investment) and five types of costs (efficiency loss, coordination issues, contracting issues, obstacles to future expansion, and issues with compensation mechanisms). Each benefit/cost was evaluated from 1 (low) to 3 (high) and then averaged across projects within the same category.

SOURCE: Vale Columbia Center; McKinsey Global Institute analysis

Governments need to think carefully about their approach to resource-related infrastructure to ensure that it provides the maximum benefits to society. Case studies suggest that the following lessons are important:

- **Plan early.** Early planning and coordination are essential to ensure infrastructure is delivered to maximize use and efficiency. In the Pilbara region of Western Australia, for example, much of the early infrastructure was built separately by mining operators with limited attention to sharing opportunities. Once made, these decisions prove much more difficult to "unwind."

- **Rigorously assess the costs and benefits of infrastructure sharing.** It is critical to conduct a detailed assessment of benefits such as economies of scale and scope, and potential costs related to contracts and difficulties in coordination.

- **Pick the right sharing model given the context.** We have identified five models for infrastructure sharing, which vary in terms of the users, operators, and owners. There is no one universally appropriate model. If infrastructure is to be provided by a third-party private operator, it is likely that the government will need to have strong regulatory capacity in order to provide that operator with incentives to invest without the promise of unreasonable returns that impose large costs on the government. Similarly, consortia models can be put in place only in situations where multiple extractive companies are operating in the same sector and the same area. Government provision requires a strong and effective state that has access to sufficient funds for investment in infrastructure.

COMPETITIVENESS AND FISCAL POLICY

Countries have much to gain from doing all they can to ensure that their resources sectors are as globally competitive as possible. A robust resources industry creates jobs, contributes to a government's finances through tax and royalty payments, and ensures sustained spending on exploration, increasing the viability of marginal deposits. National competitiveness becomes even more important as major new projects turn out to be more expensive and complex and as greater volatility in resource prices increases the risk of projects being postponed or canceled.

Yet governments in resource-driven countries have tended to focus too narrowly on fiscal policy, without considering the broader competitiveness implications for their economies. In this context, we created the McKinsey Resource Competitiveness Index, which encompasses three major elements of competitiveness: production costs, country risk, and the government "take" (the share of revenue that accrues to the government). Our approach takes into account the real economics of projects, including a country's geology and factors such as the availability of infrastructure and regulatory or policy risks. Governments have the ability to affect all three of the elements of competitiveness including, of course, how much of the revenue pie they will take by setting royalties and taxes.

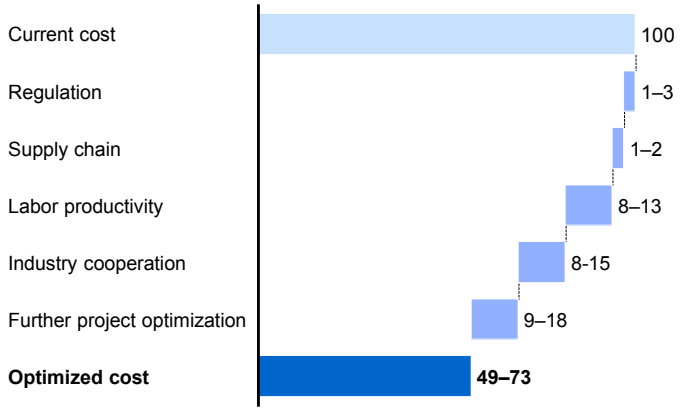
Production costs vary significantly relative to revenue depending on the type of resource and the geology of any particular asset. Costs (as a share of project revenue) are generally higher in mining than in oil and gas and for new sites. The index demonstrates that the government take is closely correlated to production costs. In essence, when production costs are high, the government take is necessarily lower to ensure that costs are competitive with alternative investments. This is true for individual resources and across resources. Governments obviously cannot control factors such as the proximity of resource deposits to the coast, the quality of crude oil, or mineral grades. But there are still avenues available to reduce capital and operating costs, especially by focusing on regulation, supply chains, productivity, and cooperation with the industry. Recent McKinsey work on liquefied natural gas (LNG) in Australia estimated that government and industry could reduce operating costs by more than 50 percent (Exhibit E8).

Political or regulatory risk (measured as a share of the value of a project) can sometimes amount to almost 40 percent of the value of the government take expressed as a percentage of revenue. This significantly weakens the competitiveness and attractiveness of the country. Even allowing for below-optimal levels of government take, this demonstrates the importance of risk to companies. There are large opportunities for governments to reduce risk by developing their ability to understand and negotiate contracts (ensuring that the contracts are fair and seen to be fair), adopting a set of formal legal mechanisms to help reassure investors, and generally improving interaction with investors and companies. Governments will achieve far more by focusing on production costs and reducing risks in collaboration with resource companies than by narrowly focusing on trying to increase the government take. Successfully reducing production costs and risks produces a larger revenue pie that can then be shared by the government and the resource companies.

Exhibit E8

McKinsey research estimates that government and industry action can cut costs by more than 50 percent

Impact on potential cost reduction measure by government and industry[1]
%



1 Based on McKinsey analysis of liquefied natural gas (LNG) projects in Australia.
NOTE: Numbers may not sum due to rounding.
SOURCE: *Extending the LNG boom: Improving Australian LNG productivity and competitiveness*, McKinsey Oil & Gas and Capital Productivity Practices, May 2013; McKinsey Global Institute analysis

LOCAL-CONTENT DEVELOPMENT

Beyond generating taxes and royalties, the extractive industry can make substantial contributions to a country's economic development by supporting local employment and supply chains. Between 40 and 80 percent of the revenue created in oil and gas and in mining is spent on the procurement of goods and services, often exceeding tax and royalty payments in some cases.

Increasing the proportion of goods and services that are procured locally ("local content") is often a key goal for policy makers in resource-driven countries. In fact, we find that more than 90 percent of resource-driven countries have some form of local-content regulation in place.

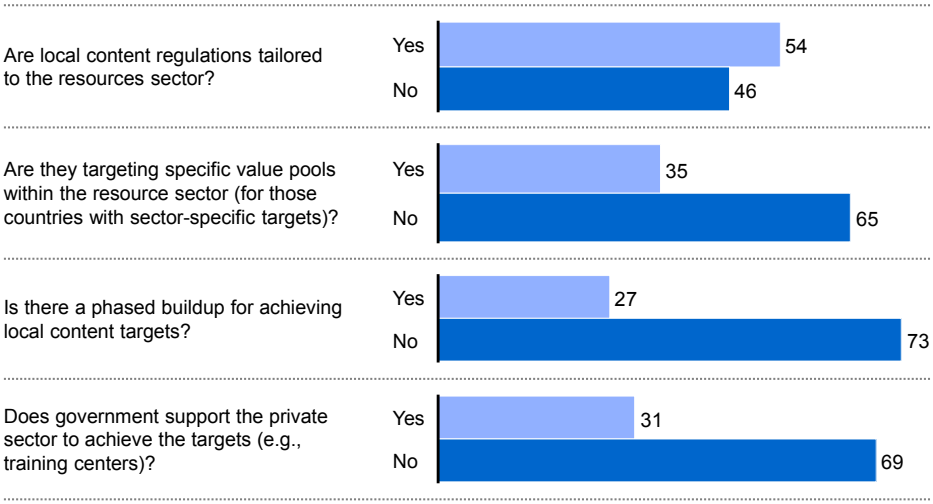
But if these regulations are designed poorly, they can substantially reduce the competitiveness of the resources sector, endangering the jobs and investment that it brings, as well as violate free trade agreements. Regulation can, for instance, cause cost inflation or delay the execution of projects. Brazil has increased local-content requirements to up to 65 percent in bidding rounds for offshore licenses. Given the profile of typical offshore production, this often implies that operators in Brazil are legally bound to source FPSO vessels locally. In the past, local operators took much longer to build these vessels than global companies, leading to significant project delays. While performance of Brazilian shipyard operators appears to have improved recently, there is still the potential risk of delays in project execution and production ramp-up.

Unfortunately, we find that much of the current local-content legislation does not appear to be well designed (Exhibit E9).

Exhibit E9

Current local content regulations are often not well designed

% (n = 27[1])



1 Sample is focused on the 27 (of the total set of 87) resource-driven countries that have hard legislation.
SOURCE: McKinsey Global Institute local content database; McKinsey Global Institute analysis

The following four gaps stand out:

- **Lack of sector-specific requirements.** Almost half of resource-driven countries in our sample had blanket requirements on local content that apply across all sectors.

- **Failure to target the right value pools.** Approximately two-third of countries in our database do not target specific value pools such as basic materials like steel and cement; low- to medium-complexity equipment and parts including pumps, explosives, and chemicals; or high-complexity equipment and parts. Of those countries that do target specific value pools within the resources sector, at least half fail to target the correct value pools in terms of fit with local capabilities. For example, the Democratic Republic of the Congo requires that 96 percent of roles in the mining sector—and 98 percent of management positions—be filled by nationals, but the number of people with the necessary technical and managerial skills and experience is simply not available.

- **No time frames stipulated or sunset clauses defined.** Very few resource-driven countries with local-content regulation take a phased approach in which they gradually build up the share of local content. Instead, most regulation calls for the immediate fulfillment of local-content shares. The result is either targets so high that they compromise competitiveness, in some cases preventing the resource from being developed at all, or so low that they are meaningless in terms of offering economic benefits to the local population. In addition, we found no evidence of any sunset clauses on the preferential treatment given to local firms in this legislation, potentially reducing the incentive of these firms to become globally competitive.

- **No supporting government institutions.** In more than two-thirds of the countries in our database, there is no structural government support for resource companies to achieve local-content targets through providing training centers, for instance, or financing for local suppliers to help them build up their businesses.

Our analysis of a number of case studies and McKinsey experience suggests that officials should apply the following five fundamental principles to achieve effective local-content policies:

- **Know where the value is and where the jobs are.** The first imperative is for policy makers to gain detailed knowledge of the resources supply chain so that they understand where total value is in terms of revenue and employment. In mining, our analysis implies that governments should focus on the production phase if they want to increase local content, because this is when the bulk of spending takes place. In this phase, the largest spending categories are manual and low-skilled labor; basic materials; management, and engineering, procurement and construction management (EPCM); business support services; and utilities. The patterns of spending in oil and gas projects are different from those in mining projects. In oil and gas, a much larger share of total procurement funds is spent on integrated plant equipment solutions and a much lower share on manual and low-skilled labor. The potential to create jobs also differs from total procurement spending in many cases. Several categories are relatively more labor-intensive and therefore create more jobs than other categories.

- **Understand the competitive edge.** The spending that can be captured locally varies significantly among countries due to a number of factors, including the type of resource, the level of industrialization, the country's unique aspects such as location and language, and whether other industries have a significant presence. We find that in advanced economies such as Australia, up to 90 percent of total (mining) spending in the production phase is highly amenable to local content. In underdeveloped countries that have not yet industrialized and that have relatively new resources sectors—Guinea being an example—very little of overall spending is amenable to local content, at least initially.

- **Carefully assess the opportunity cost of regulatory intervention.** When governments impose local-content requirements, they must carefully assess whether regulations are too unwieldy for companies, unnecessarily raising costs, potentially causing significant delays, and damaging competitiveness. They should also guard against creating perverse incentives. For example, regulation that automatically gives contracts to any local provider bidding within 10 percent of the best price will discourage local firms from becoming competitive with multinationals unless there is a clear sunset clause that stipulates when this preferential support will end.

- **Don't just regulate—enable.** Most resource-driven countries devote too little attention to creating an environment that supports the achievement of local-content targets. Government can assist in a number of areas, from helping to develop skills to providing financing and coordinating local suppliers.

- **Carefully track and enforce progress.** Making procedures simple to administer and track, appointing a credible regulator with enforcement power, and creating a regulatory body that can coordinate efforts are crucial to making progress on local content.

Private companies play an essential role in the development of local content. There are numerous cases in which a private company took the lead in developing local suppliers, not only to comply with local-content regulation but also to improve their cost competitiveness. It is crucial for companies to have a detailed understanding of their future spending profile and the local supplier base; to organize effectively to achieve their local-content goals by rooting them deeply in company processes for procurement and human resources rather than corporate social responsibility; to engage proactively with the government as they make local-content policy decisions; and to support the development of local supply chains through targeted skill-building and R&D programs.

SPENDING THE WINDFALL

There is a broad range of approaches for governments to use resource revenues. They can invest the money abroad or use it to repay foreign debt; MGI research has shown that sovereign wealth funds worldwide controlled $5.6 trillion at the end of 2012 and that 57 percent of this sum came from natural resources. Countries can also invest at least a portion of their resources revenue at home in infrastructure and other key areas. Botswana, for instance, earmarks mining revenue for specific development purposes such as education and health through its Sustainable Budget Index. Some countries direct a share of revenue to specific regions for both investment and consumption purposes. Brazil splits its disbursement of CFEM (Financial Compensation for the Exploration of Mineral Resources) mining royalties so that 65 percent goes to local governments, 23 percent to mining states, and the remainder to the National Department of Mineral Production. Governments can also use resources revenue more generally for domestic needs such as higher wages for public-sector workers, subsidies for energy resources, or other social-welfare programs. Finally, they can make direct transfers to citizens, as Alaska does with a portion of its oil revenue.

History is littered with examples of governments squandering resource windfalls either through corruption or simple mismanagement. Such waste can, and must, be avoided. While the best approach may vary somewhat depending on the country, there are some valuable lessons from international experience to date that we think broadly apply. Governments should consider the following if they are to reap the full benefits of their resource endowments:

- **Set expectations.** In order to counter ill-informed pressure that could lead to wasteful spending, governments need to agree early in the process on the principles for how the resource wealth will be used and manage expectations among their citizens accordingly. In Ghana, the government undertook an extensive consultative exercise to discuss how to use the country's oil wealth, and interestingly, the country's poorest regions were the most eager to save funds.[17] When Botswana discovered its diamond wealth, the government quickly spread the message, "We're poor and therefore we must carry a heavy

17 Joe Amoako-Tuffour, *Public participation in the making of Ghana's petroleum revenue management law*, National Resource Charter Technical Advisory Group, October 2011.

load." This message helped the government to justify investing more of the money rather than spending it.

- **Ensure spending is transparent and benefits are visible.** Governments need to ensure that institutional mechanisms are put in place for a high level of transparency so that recipients see the benefits of invested resource windfalls. In Uganda, the finance ministry sends details to the local media of all the money each school receives from the state. This has resulted in 90 percent of non-salary funding actually getting to schools instead of around 20 percent as in the past (with the remainder being misappropriated). In Botswana, the government's Sustainable Budget Index monitors whether the mineral revenue it collects is being used to promote sustainable development and finance "investment expenditure," including recurrent spending on education and health.[18]

- **Smooth government expenditure.** Setting a target for the non-commodity government budget balance can insulate public expenditures from volatility. During periods of relatively high commodity prices or output, the overall budget might accumulate a surplus, while during periods of low prices or output it might run a deficit but leave spending intact. For example, Chile has established a budget balance rule, defined in structural terms, with provisions that correct for deviations in the prices of copper and molybdenum from their long-term levels, as judged by an independent panel of experts.[19]

- **Keep government lean.** Resource-driven countries often suffer from bloated government bureaucracies. In Kuwait and the United Arab Emirates, for instance, more than 80 percent of the local population is employed in the public sector. Pay increases can be large. The government of Qatar raised public salaries by 60 percent in 2012. Such approaches reduce not only public-sector productivity but also incentives for working in the private sector, inhibiting wider economic development. Governments should actively seek to keep the public sector in proportion by regularly comparing ratios for each function with those of other countries. They should also consider how they can consistently recognize duplicative structures in the public sector that could be consolidated.[20] One method to keep pay consistent is to benchmark wages to similar jobs in the private sector and to assign public-sector roles a "clean wage" without hidden perks or privileges.

- **Shift from consumption to investment.** Channeling some of the resource wealth into domestic investment and savings is crucial to start transforming natural resource wealth into long-term prosperity. Establishing institutional mechanisms to support this process can be useful, because they can address any bias toward government consumption spending and deficits, enhance fiscal discipline, and raise the quality of debate and scrutiny. For example, Australia established the Parliamentary Budget Office in July 2012 to provide independent and non-partisan analysis of the budget cycle, fiscal policy, and the financial implications of proposals.

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18 *Towards mineral accounts for Botswana*, Department of Environmental Affairs, May 2007.

19 *Fiscal rules: Anchoring expectations for sustainable public finance*, IMF discussion paper, December 2009.

20 *Transforming government performance through lean management*, McKinsey Center for Government, December 2012.

- **Boost domestic capabilities to use funds well.** Resource-driven governments need to ensure the development of strong investment capabilities in the public sector. The International Monetary Fund (IMF) and the World Bank jointly produce an index of public investment efficiency, enabling countries to track progress in this area.[21] Some of the key areas to address include project appraisal, selection, implementation, and auditing.

ECONOMIC DEVELOPMENT

Very few resource-driven countries have sustained strong GDP growth for longer than a decade. Even those that have appeared to put their economics on a healthier longer-term growth trajectory have rarely managed to transform that growth into broader economic prosperity, as measured by MGI's economic performance scorecard. But doing so is not impossible. One major imperative for governments is to focus on removing barriers to productivity across five key areas of the economy—the resources sector itself; resource rider sectors such as utilities and construction; manufacturing; local services such as retail trade and financial services; and agriculture. Local services, which include hospitality, telecommunications, and financial sectors, are often seen as the indirect beneficiaries of the resource booms. These sectors can achieve large productivity improvements, which can often result in significant growth in GDP and employment, but these sectors are often overlooked by policy makers. Past MGI work has highlighted how removing microeconomic barriers can significantly increase productivity and economic growth.[22]

The extractive industry has much to gain from being more thoughtful about economic development

Governments in resource-driven economies are being tested, but so are extractive companies operating in these environments. They face three factors that put value at risk in these economies.

The first of these is that high and volatile resource prices have led to significant choppiness in resource rents and increased the likelihood that governments feel "cheated" and seek to renegotiate terms. Data from the Royal Institute of International Affairs (Chatham House) show that the incidence of arbitration corresponds strongly with the rise in oil and metal prices and mineral prices since 2000.[23] Second, exploration and production are increasingly moving toward lower-income, less-developed markets that are often environmentally and logistically challenging and geologically complex. This is driving up project costs and increasing the risk of delays. Finally, extractive projects represent a disproportionate share of these economies. For instance, the Simandou iron ore project in Guinea is expected to produce revenue in excess of 130 percent of the country's current annual GDP, based on forecast iron ore prices and production growth. Extractive companies engaged in large projects such as these have a very visible role in the economies in which they operate. They are subject to

21 Era Dabla-Norris et al., *Investing in public investment: An index of public investment efficiency*, IMF working paper number 11/37, 2010.

22 *Investing in growth: Europe's next challenge*, McKinsey Global Institute, December 2012.

23 Bernice Lee et al., *Resources futures*, Chatham House, December 2012.

greater scrutiny in the media and among citizens, who have elevated expectations of the jobs these companies create and the tax revenue they provide.

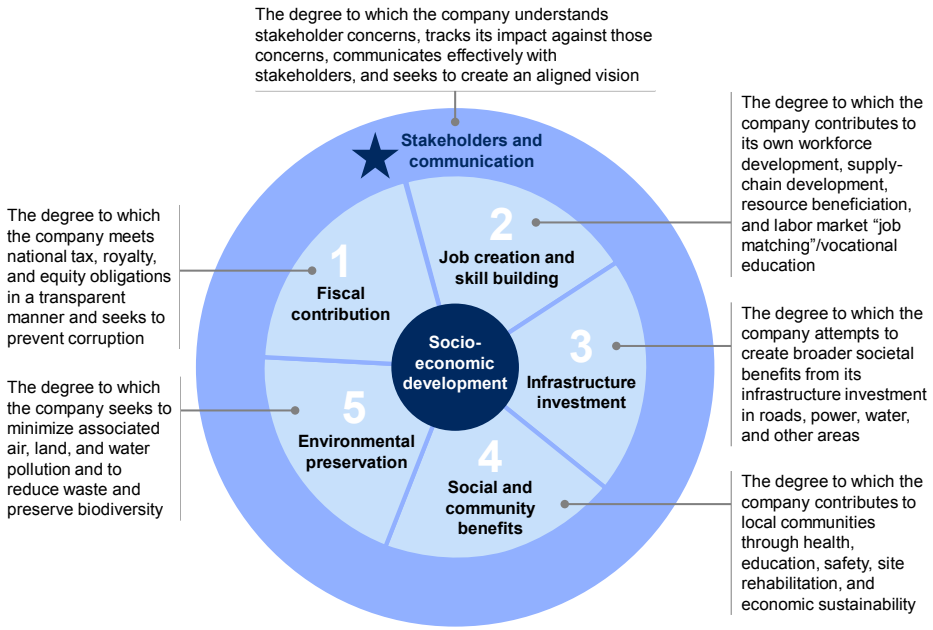
Managing this evolving and risky landscape requires extractive companies to shift from an "extraction" mindset to a "development" one. It would help them to navigate the journey if they were to take a more strategic approach to their local development activities. They need to ensure that their chosen development priorities reflect a detailed understanding of the country in which they are operating and that these same development priorities create lasting value to their businesses. They also need to embed the actions they take in a relationship with host governments that creates strong incentives for both parties to adhere to agreements throughout the lifetime of the project.

In developing an understanding of the host country, companies need to start with the geographical, social, economic, institutional, and other factors directly related to resources. Then they need to go beyond a basic analysis of political, institutional, and economic trends in the country to consider fundamental questions such as the history of the country and its resources sector. They should also assess how dependent government finances are on resource endowments, as well as competitiveness factors such as the country's position on the global cost curve for a particular resource and its importance to global supply.

Second, companies need to be rigorous in assessing their own contribution to broader economic development and compare their performance with stakeholders' expectations. We have developed a tool to assess the economic contributions that companies make. It looks at five aspects: fiscal contribution; job creation and skill building; infrastructure investment; social and community benefits; and environmental preservation. The tool examines whether companies match the expectations of key stakeholders such as host governments and local communities in each of the five core areas (Exhibit E10).

Exhibit E10

We identify five core elements of a company's local development contributions, and one critical enabler


The degree to which the company understands stakeholder concerns, tracks its impact against those concerns, communicates effectively with stakeholders, and seeks to create an aligned vision
Stakeholders and communication
The degree to which the company contributes to its own workforce development, supply-chain development, resource beneficiation, and labor market "job matching"/vocational education
2
Job creation and skill building
The degree to which the company meets national tax, royalty, and equity obligations in a transparent manner and seeks to prevent corruption
1
Fiscal contribution
Socio-economic development
3
Infrastructure investment
The degree to which the company attempts to create broader societal benefits from its infrastructure investment in roads, power, water, and other areas
The degree to which the company seeks to minimize associated air, land, and water pollution and to reduce waste and preserve biodiversity
5
Environmental preservation
4
Social and community benefits
The degree to which the company contributes to local communities through health, education, safety, site rehabilitation, and economic sustainability

SOURCE: McKinsey Economic Development Assessment Tool; McKinsey Global Institute analysis

Our analysis finds that companies' efforts often do poorly in matching the expectations of host governments. In one instance, the company prioritized, and was performing strongly in, all areas of environmental management, but far less well on infrastructure and job creation. Yet the latter two were the main areas of concern for the local government. Furthermore, our pilots in this area indicate that the performance and priorities of different parts of the same company varied. We also find that companies have generally done a poor job of communicating their efforts and of understanding and engaging with key stakeholders.

Finally, any package of initiatives needs to be part of a relationship with host governments that will endure for the lifetime of the project, which can stretch for decades. The specific ways in which companies make an effective contribution will depend on the context, but our work with extractive clients suggests some core guiding principles. These include being careful about signing agreements that optimize for the short term but that could later be regarded by governments as unfair and grounds for renegotiation; making it clear to governments what is at stake by being transparent about the short- and medium-term contribution of the resources sector to jobs, exports, and fiscal revenue; ensuring that the company is seen as indispensable to the country's broader agenda through, for example, the technological know-how it brings, the international capital it can mobilize, and its contribution to the country's economic development; and being willing to play tough in the case of reneging on agreements (using all available legal remedies). On the latter point, an example is ExxonMobil, which seized Venezuela's "cash waterfall" funds as compensation for the nationalization of the company's assets.

There will always be circumstances that an extractive company will find difficult or even impossible to manage. But taking such a strategic approach to local development issues can help avoid time-consuming efforts on a range of "nice-to-do" economic development contributions and enable extractive companies to spend more time and effort on helping host governments to create a genuine new source of enduring competitive advantage.

□ □ □

The “Asian Tiger” economies of Hong Kong, Singapore, South Korea, and Taiwan are noted for having achieved rapid economic growth from 1960 to 1990 though industrialization and export-led manufacturing. More recently, China has largely followed this growth model, taking more than 500 million people out of poverty. Some resource-driven countries have tried to emulate the successful development models of the Asian Tigers. However, this approach fails to take into account the unique circumstances of economies driven by resources. Instead, they should consider reframing their economic strategies around three key imperatives: effectively developing their resources sector; capturing value from it; and transforming that value into long-term prosperity. In each of these areas, relevant lessons from other resource-driven countries can be tailored to the local context. This new “Resource Tiger” growth model has the potential not only to transform the economic prospects of these resource-driven economies, but also to take more than 500 million people out of poverty by 2030, and thus achieve as great an impact as the Asian Tiger growth model.

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Resource Revolution: Tracking global commodity markets (September 2013)

This first annual survey of resource markets was conducted by MGI and McKinsey's sustainability and resource productivity practice. The set of documents, which includes an interactive commodity price index tool, describes how commodities may be off recent peaks, but the resource "supercycle" isn't dead. Prices still reflect emerging-market demand, a challenging geology, innovative technology, and improved resource productivity.

Beyond the boom: Australia's productivity imperative (August 2012)

Australia has been riding the wave of Asia's economic growth, supplying coal, iron ore, and minerals to meet unprecedented demand in China and other emerging markets. As commodity prices spiked in recent years, the country has attracted a flood of investment into its mines, processing plants, pipelines, and ports. Asia's economic and demographic trends point to sustained demand in the decades ahead, but growth fueled by demand for natural resources carries risk.

Resource Revolution: Meeting the world's energy, materials, food, and water needs (November 2011)

Meeting the world's resource supply and productivity challenges will be far from easy—only 20 percent of the potential is readily achievable, and 40 percent will be hard to capture. There are many barriers, including the fact that the capital needed each year to create a resource revolution will rise from roughly $2 trillion today to more than $3 trillion.

Pathways to a low-carbon economy: Version 2 of the global greenhouse gas abatement cost curve (McKinsey & Company, January 2009)

This report includes an updated assessment of the development of low-carbon technologies and macroeconomic trends, and a more detailed understanding of abatement potential in different regions and industries. It also assesses investment and financing requirements and incorporates implementation scenarios for a more dynamic understanding of how abatement reductions could unfold.

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